

## THE CLAIMS

### What Is Claimed Is:

- 5     1. <sup>Sub  
a1</sup> A gallium nitride-based HEMT device, comprising a channel layer formed of an InGaN alloy.
2.     The device of claim 1, comprising an AlGaIn/InGaIn heterostructure.
- 10    3.     The device of claim 1, comprising a GaN layer, an InGaIn layer over the GaN layer, and an AlGaIn layer over the InGaIn layer.
4.     The device of claim 1, which does not comprise an aluminum-containing layer.
- 15    5.     The device of claim 4, comprising a GaN/InGaIn HEMT.
6.     The device of claim 4, comprising an InGaIn/InGaIn HEMT.
7.     The device of claim 1, comprising an AlGaIn layer.
- 20    8.     The device of claim 7, wherein the AlGaIn layer is undoped.
9.     <sup>Sub  
a2</sup> The device of claim 7, wherein the AlGaIn layer is doped with a dopant increasing the sheet density thereof.
- 25    10.    A method of fabricating a GaN-based HEMT device, comprising forming a channel layer for said device of an InGaIn alloy.